



SEQUENCE LISTING

<110> Williams, Deryck J.
McLaird, Merry B.
Hresko, Michelle Coutu
Frevert, Anita M.
Worthington, Ronald E.
Kloek, Andrew P.
Davila-Aponte, Jennifer A.
Bradley, John D.
Xu, Siqun

<120> NEMATODE PHOSPHOETHANOLAMINE
N-METHYLTRANSFERASE-LIKE SEQUENCES

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<140> US 10/602,268

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<150> US 60/390,490

<151> 2002-06-21

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<213> Ascaris suum

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<212> DNA

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<212> DNA

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<212> DNA

<213> Ascaris suum

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<212> DNA

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<210> 7
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<213> Ascaris suum

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Asp Glu Phe Glu Ala Asp Asp Arg Ala Asp Ile Ile Ser Ser Leu Pro
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Asp Leu His Gly Lys Asp Ile Val Asp Ile Gly Ala Gly Ile Gly Arg
      50           55           60
Phe Thr Thr Ile Phe Ala His Asp Ala Arg His Val Leu Ser Cys Asp
      65           70           75           80
Phe Ile Glu Ser Phe Met Ala Lys Asn Lys Glu Arg Asn Ala His Phe
      85           90           95
Ser Asn Ile Ser Tyr Gln Val Gly Asp Ala Val His Leu Gln Leu Asp
      100          105          110
Pro Asn Ser Val Asp Leu Val Phe Thr Asn Trp Leu Met Met Tyr Leu
      115          120          125
Ser Asp Asp Glu Val Ile Arg Phe Leu Leu Asn Ala Leu Arg Trp Leu
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Arg Pro Asn Gly Tyr Leu His Leu Arg Glu Ser Cys Ser Gln Pro Ser
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Thr Ala Arg Val Gly Gly Thr Met His Asn Ser Thr Glu Ile Asn Pro
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Arg Tyr Arg Glu Leu Asp Gly Thr Leu Phe Arg Phe Glu Val His Trp
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Ala Cys Ser Val Pro Thr Tyr Ile Val Val Gln Asn Asn Trp Arg Gln
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Val His Trp Leu Thr Gln Lys Val Arg Cys Asn Asp Asp Ala Ile Met
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Ser Ile Glu His Leu Leu Gly His Phe Ser Thr Leu Trp Lys Val Glu
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Gln Gln Lys Trp Asp Arg Tyr Leu Asp Asn Glu Ser Tyr Cys Trp Thr
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Asp Glu Val Phe Gly Tyr Ala Leu Met Lys Glu Thr Ile Glu Ser Met
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<212> PRT

<213> Haemonchus contortus

<400> 8

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65	70	75	80
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	85	90	95
Gly Asn Ile Ser Tyr	Gln Ile Gly Asp	Ala Val His Leu	Gln Met Asp
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Glu Lys Ser Val Asp	Leu Val Phe Thr	Asn Trp Leu Met	Met Tyr Leu
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Ser Asp Arg Glu Val	Ile Glu Phe Leu	Leu Asn Ala Met	Arg Trp Leu
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Arg Ala Asp Gly Tyr	Ile His Leu Arg	Glu Ser Cys Ser	Glu Pro Ser
145	150	155	160
Thr Gly Arg Leu Lys	Thr Ala Thr Met	His Ser Ala Val	Asp Ala Asn
	165	170	175
Pro Thr His Tyr Arg	Phe Ser Ser Leu	Tyr Ile Lys Leu	Leu Arg Ala
	180	185	190
Ile Arg Tyr Gly Asp	Ser Asp Gly Lys	Met Trp Lys Phe	Asp Val Gln
	195	200	205
Trp Ser Cys Ser Val	Pro Thr Tyr Ile	Arg Arg Cys Asn	Asn Trp Arg
	210	215	220
Gln Val His Trp Leu	Thr Lys Lys Val	Pro Ala Val Gly	Asp Glu Glu
225	230	235	240
Thr Ser Val Asp Asp	Leu Leu Asn Leu	Phe Ser Gln Ile	Trp Pro Ala
	245	250	255
Glu Gln Lys Thr Trp	Asp Glu Lys Leu	Asp Asn Glu Lys	Tyr Ser Trp
	260	265	270
Thr Asp Lys Ile Phe	Ser Asn Ala Ile	Asp Asp Glu Val	Val Pro Lys
	275	280	285
Asn Ser Thr Ala Tyr	Val Phe Thr Pro	Arg Gln Arg Ser	Pro Phe Leu
	290	295	300
His Val Asn Ser His	Leu Leu Ala Glu	Lys Phe Thr Cys	Asn Val Trp

305					310					315					320
Asn	Val	Glu	Thr	Lys	Glu	Tyr	Leu	Tyr	Arg	Thr	Ser	Leu	Thr	Lys	Ala
				325					330					335	
Asn	Asn	Gln	Lys	Asp	Gln	Arg	Val	Arg	Phe	Gly	Trp	Asn	Glu	Ser	Leu
			340					345					350		
Ser	Ser	Pro	Ile	Asp	Tyr	Trp	Asn	Gln	Arg	Asp	Ala	Ser	Phe	Asp	Cys
		355					360					365			
Met	Val	Ala	Thr	Glu	Leu	Leu	Ala	Thr	Cys	Asp	Asp	Glu	Ser	Val	Lys
	370					375					380				
Ser	Ile	Ala	Ser	Ile	Met	Lys	Pro	Glu	Ala	Lys	Val	Val	Leu	Leu	Glu
385					390					395					400
Pro	Val	Ser	Gly	Ile	Asp	Glu	Thr	Ser	Val	Arg	Gln	Arg	Met	Thr	Thr
				405					410					415	
Cys	Gly	Phe	Lys	Asn	Ile	Thr	Ile	Val	Asp	Val	Thr	Gln	Glu	Ser	Leu
			420					425					430		
Asn	Ala	Glu	Val	Ser	Phe	Ile	Lys	Asp	His	Asn	Leu	Asp	Val	Glu	Leu
	435						440					445			
Ser	Gly	Cys	Asn	Tyr	Leu	Leu	Ile	Lys	Ala	Ser	Leu				
	450					455					460				

<210> 9

<211> 457

<212> PRT

<213> Meloidogyne incognita

<400> 9

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Ile	Tyr	His	Ser	Phe	Trp	Asn	Lys	Phe	Ser	Asp	Arg	Ala	Asp	Asn	Thr
			20					25					30		
Ser	Met	Leu	Leu	Asn	Ala	Asp	Ala	Asp	Lys	Phe	Glu	Ala	Leu	Asp	Arg
		35					40					45			
Ala	Glu	Ile	Ile	Gly	Met	Leu	Pro	Ser	Phe	Lys	Asn	Lys	Phe	Val	Val
	50					55					60				
Asp	Ile	Gly	Ala	Gly	Ile	Gly	Arg	Phe	Thr	Thr	Glu	Phe	Ala	Lys	Lys
65					70					75					80
Ala	Arg	Glu	Val	Val	Ser	Thr	Asp	Phe	Val	Ala	Ser	Phe	Ile	Glu	Lys
				85					90					95	
Asn	Arg	Glu	Thr	Asn	Ile	Ala	Phe	Asn	Asn	Ile	Glu	Trp	Arg	Val	Gly
		100						105					110		
Asp	Ala	Val	Arg	Leu	Asp	Phe	Glu	Glu	Gly	Ser	Ile	Asp	Ile	Val	Phe
		115					120					125			
Thr	Asn	Trp	Leu	Leu	Met	Tyr	Leu	Val	Asp	Glu	Glu	Val	Val	Gln	Phe
	130					135					140				
Leu	Ile	Asn	Ala	Ile	Lys	Trp	Leu	Arg	Pro	Gly	Gly	Tyr	Leu	His	Leu
145					150					155					160
Arg	Glu	Ser	Cys	Ser	Glu	Pro	Ser	Ser	Lys	Lys	Ser	Asn	Asn	Ser	Leu
			165						170					175	
His	Ser	Asn	Ser	Asp	Ser	Ile	Asn	Pro	Thr	Lys	Tyr	Arg	Phe	Ser	Ser
		180					185						190		
Ala	Tyr	Ile	Gln	Leu	Leu	Lys	Ser	Ile	Asn	Phe	Lys	Ser	Gly	Asp	Gly
	195						200						205		
Thr	Val	Trp	Gly	Phe	Lys	Ile	His	Trp	Ala	Ser	Ser	Val	Asn	Val	Tyr
	210					215					220				
Ile	Gln	Lys	Asn	Ala	Asn	Trp	Arg	Gln	Val	His	Trp	Leu	Val	Ser	Lys
225					230					235					240
Val	Pro	Lys	Lys	Glu	Lys	Phe	Met	Pro	Asn	Leu	Gly	Thr	Leu	Leu	Gly

				245				250					255				
Glu	Lys	Trp	Pro	Glu	Glu	Gln	Lys	Glu	Trp	Asp	Asn	Lys	Leu	Asp	Leu		
			260					265					270				
Ala	Leu	Asn	Glu	Asn	Gln	Asn	Ile	Thr	Ser	Thr	Leu	Ala	Ser	Tyr	Leu		
		275					280					285					
Leu	Ser	Ser	Gly	Ile	Gly	Thr	Asn	Ser	Val	Ile	Leu	Val	Phe	Asp	Leu		
	290					295					300						
Arg	Asn	Ser	Glu	Asn	Gln	Pro	Ser	Ile	Asn	Val	His	Thr	Leu	Ala	Asn		
305					310					315					320		
Arg	Leu	Asn	Ser	Asn	Ile	Trp	Ser	Val	Ser	Leu	Asn	Pro	Phe	Cys	Phe		
				325				330					335				
Arg	His	Ser	Leu	Thr	Leu	Ala	Asn	Asn	Asn	Gln	Asp	Arg	Arg	Ile	Arg		
			340					345					350				
His	Ser	Trp	His	Glu	Asp	Ile	Glu	Ser	Ala	Phe	His	Phe	Leu	Gly	Glu		
	355					360				365							
Gln	Ile	Ser	Gly	Lys	Glu	Lys	Asn	Ile	Ser	Arg	Leu	Phe	Asp	Val	Ile		
	370					375				380							
Ile	Gly	Ile	Gly	Leu	Leu	Glu	Lys	Ile	Lys	Lys	Met	Lys	Asp	Ala	Ser		
385				390						395				400			
Glu	Lys	Val	Glu	Lys	Ile	Leu	Gly	Arg	Tyr	Leu	Leu	Ser	Ile	Glu	Thr		
			405					410					415				
Gly	Glu	Gly	Asp	Asp	Ile	Arg	Lys	Glu	Lys	Lys	Asn	Glu	Asp	Ile	Val		
		420				425					430						
Glu	Tyr	Phe	Pro	Ser	Glu	Leu	Phe	Thr	Lys	Gln	Thr	Ile	Glu	Phe	Lys		
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Ala	Asp	Asn	Gly	Phe	Asn	Gln	Leu	Asp									
	450					455											

<210> 10

<211> 469

<212> PRT

<213> Strongyloides stercoralis

<400> 10

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		20					25					30					
Ser	Leu	Ile	Glu	Lys	Asn	Asp	Arg	His	Asp	Val	Cys	Leu	Leu	Leu	Pro		
	35					40					45						
Asp	Leu	Lys	Gly	Lys	Thr	Val	Leu	Asp	Ala	Gly	Ala	Gly	Ile	Gly	Arg		
	50				55					60							
Phe	Thr	Ala	Glu	Leu	Ala	Glu	Arg	Ala	Glu	Lys	Val	Tyr	Ala	Ser	Asp		
65				70					75					80			
Phe	Ile	Ser	Glu	Tyr	Val	Thr	Lys	Leu	Gln	Glu	Leu	Ser	Ala	Glu	Ala		
			85				90						95				
Leu	Lys	Asn	Gly	Lys	Ile	Ile	Asp	Val	Thr	Val	Ala	Asp	Ala	Thr	Cys		
		100					105					110					
Leu	Ser	Tyr	Pro	Glu	Asn	Ser	Tyr	Phe	Leu	Val	Phe	Thr	Asn	Trp	Leu		
	115					120					125						
Phe	Met	Tyr	Phe	Asn	Asn	Thr	Glu	Cys	Val	Arg	Phe	Thr	Val	Asn	Ala		
	130				135					140							
Leu	Lys	Trp	Leu	Glu	Glu	Gly	Gly	Tyr	Phe	Lys	Leu	Arg	Glu	Ser	Cys		
145				150				155						160			
Ser	Glu	Pro	Ser	Thr	Arg	Arg	Val	Gly	Asn	Arg	Asn	Glu	Thr	Ser	Leu		
			165				170					175					
His	Ala	Ala	Val	Gln	Ser	Asn	Pro	Thr	Glu	Tyr	Arg	Phe	Ser	Ser	Val		

[illegible]

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<210> 11
<211> 437
<212> PRT
<213> Ascaris suum
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<400> 11															
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Pro	Lys	Asp	Ala	Leu	Thr	Ser	Val	Leu	Leu	Val	Thr	Ser	Ala	Gln	Ser
			20					25					30		
Glu	Glu	Ser	Asn	Ser	Ser	Leu	Val	Ala	Leu	Phe	Glu	Asp	Arg	Ala	Ile
		35				40					45				
Asn	Val	Thr	Ile	Val	Glu	Arg	Leu	Glu	Gly	Leu	Gln	Ser	Thr	Arg	Ala
	50				55					60					
Asp	Ala	Tyr	Asp	Ala	Ile	Ser	Asn	Lys	Leu	Ile	Val	Glu	Asn	Cys	
65				70					75					80	
Leu	Ile	Asn	Lys	Pro	Ser	Asp	Leu	Asp	Thr	Phe	Val	Ala	Ser	Ala	Leu
				85					90					95	
Lys	Glu	Glu	Gly	Val	Leu	Ile	Val	Arg	Glu	Asp	Leu	Asn	Gly	Cys	Ser

			100					105					110				
Ala	Cys	Glu	Lys	Val	Ala	Gln	Leu	Thr	His	Phe	Phe	Asp	Leu	Phe	Arg		
		115					120					125					
Thr	Thr	Leu	Asn	Gly	Val	Thr	Ile	Gly	Phe	Lys	Phe	Tyr	Ser	Leu	Lys		
		130				135					140						
Gln	Val	Asn	Ala	Ser	Ile	His	Thr	Glu	Gly	Asn	Phe	Leu	Asp	Val	Phe		
145					150					155					160		
Trp	Ile	Leu	Arg	Lys	Glu	Cys	Phe	Glu	Ala	Leu	Asp	Glu	Asn	Gln	Lys		
				165				170						175			
Thr	Lys	Thr	Phe	Arg	Asp	Phe	Leu	Asp	Thr	Thr	Gln	Tyr	Thr	Asp	Glu		
			180					185						190			
Ser	Ile	Arg	Ala	Tyr	Glu	Trp	Ile	Phe	Gly	Asp	Asn	Phe	Ile	Ser	Pro		
		195					200					205					
Gly	Gly	Tyr	Asp	Glu	Asn	Leu	Glu	Val	Leu	Lys	Arg	Phe	Gly	Asp	Leu		
		210				215					220						
Lys	Pro	Asp	Cys	Lys	Met	Leu	Asp	Ile	Gly	Val	Gly	Ile	Gly	Gly	Gly		
225					230					235					240		
Ala	Arg	Gln	Ala	Ala	Arg	Glu	Phe	Gly	Ala	Leu	Val	Leu	Gly	Met	Asp		
				245				250						255			
Ile	Ser	Ala	Asn	Met	Leu	Ser	Ile	Ala	Met	Asp	Arg	Leu	Gln	Asn	Glu		
			260					265					270				
Lys	Asp	Thr	Arg	Val	Arg	Tyr	Gln	Ile	Ser	Asp	Ala	Leu	Glu	Tyr	Glu		
		275					280				285						
Phe	Pro	Ala	Asn	Ser	Phe	Asp	Tyr	Val	Phe	Ser	Arg	Asp	Gly	Leu	His		
		290				295					300						
His	Asn	Glu	Arg	Ile	Asp	Ile	Val	Met	Arg	Lys	Ile	Phe	His	Trp	Leu		
305					310					315					320		
Lys	Pro	Gly	Gly	Lys	Val	Leu	Ile	Thr	Val	Tyr	Gly	Met	Gly	His	Gly		
				325					330					335			
Thr	Leu	Ser	Ala	Lys	Phe	Gln	Ala	Tyr	Val	Glu	Lys	Arg	Lys	Tyr	Phe		
			340					345					350				
Leu	Lys	Thr	Leu	Glu	Glu	Met	Val	Glu	Ile	Thr	Glu	Ala	Ala	Gly	Phe		
		355					360					365					
Glu	Asn	Val	Gln	Gly	Thr	Asn	Leu	Thr	Lys	Arg	Phe	Arg	Asp	Ile	Leu		
		370				375					380						
Leu	Asp	Glu	Arg	Thr	Lys	Thr	Leu	Asn	Arg	Lys	Asn	Glu	Phe	Leu	Glu		
385					390					395					400		
Lys	Phe	Asp	Glu	Gly	Thr	Phe	Asn	Ser	Leu	Leu	Asn	Gly	Trp	Asn	Asp		
				405				410					415				
Lys	Ile	Gly	Phe	Ile	Asp	Asp	Asp	Asn	His	Asn	Trp	Asn	Gln	Ile	Phe		
			420					425					430				
Ala	Thr	Lys	Pro	Leu													
		435															

<210> 12

<211> 472

<212> PRT

<213> Meloidogyne javanica

<400> 12

Met	Ser	Ala	Leu	Ser	Cys	Glu	Leu	Ala	Tyr	Ala	Leu	Gln	Asn	His	Pro		
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		20						25				30					
Asp	Val	Asn	Glu	Arg	Asn	Leu	Asn	Ser	Asp	Leu	Arg	Asn	Leu	Phe	Glu		
		35				40				45							
Asp	Lys	Phe	Asn	Leu	Glu	Glu	Met	Asp	Ile	Gly	Glu	Leu	Ile	Asn	Ile		

50		55		60
Ser Glu Arg Leu Asp Lys Glu Asp Asn Asp Asn Glu Glu Glu Asn Leu				
65		70		75
Glu Thr Arg Phe Asp Ala Ala Ile Cys Ser Asn Leu Phe Ile Gly Gln				80
	85		90	
Gly Ile Val Asn Asp Arg His Arg Ile Ala Gln Val Leu Gly Leu Leu				95
	100		105	
Leu Arg Leu Ile Arg Thr Asp Gly Val Val Ile Ile Arg Glu Asn Leu				110
	115		120	
Lys Gln Trp Gly Ser Arg Ser Ile Ala Asp Leu Thr Lys Phe Leu Asp				125
	130		135	
Val Phe Ala Phe Arg Lys Gln Gln Asn Asn Gln Lys Gln Gln Gln Thr				140
145		150		155
Leu Gly Phe Asn Phe Tyr Gly Met Ser Gln Val Gln Asp Ser Ile Tyr				160
	165		170	
Ala His Ser Asn Phe Leu Asp Val Phe Trp Ser Leu Thr Thr Ala Ile				175
	180		185	
Glu Val Arg Leu Tyr Asp Asp Lys Leu Ala Thr Phe Arg Glu Phe Leu				190
	195		200	
Asp Lys Thr Gln Tyr Thr Glu Asp Asn Val Ala Ser Tyr Glu Trp Ile				205
	210		215	
Phe Gly Thr Asp Phe Ile Ser Pro Gly Gly Val Asn Glu Asn Arg Arg				220
225		230		235
Val Leu Lys Tyr Phe Arg His Leu Arg Pro Gly Gln Gln Met Leu Asp				240
	245		250	
Ile Gly Val Gly Ile Gly Gly Gly Ala Arg Gln Ala Ala Arg Glu Phe				255
	260		265	
Gly Leu Gln Val Leu Gly Cys Asp Leu Ser Ser Asn Met Ile Gln His				270
	275		280	
Ala Phe Asp Arg Asn Gln Arg Asp Lys Asp His Arg Val Glu Tyr Gln				285
	290		295	
Ile Ala Asp Ala Met Val Tyr Arg Tyr Glu Ser Asn Ala Phe Asp Ile				300
305		310		315
Val Phe Ser Arg Asp Cys Ile Gln His Ile Lys Asp Thr Lys Arg Leu				320
	325		330	
Phe Arg Asn Ile Tyr Thr Trp Leu Lys Pro Gly Gly Gln Val Leu Val				335
	340		345	
Thr Met Tyr Gly Lys Gly His Gly Val Leu Ser Pro Lys Phe His Glu				350
	355		360	
Tyr Val Arg Lys Arg Gln Tyr Ala Leu Lys Thr Leu Glu Glu Tyr Arg				365
	370		375	
Glu Ile Ala His Asn Val Gly Leu Thr Thr Ile Tyr Thr Glu Asn Met				380
385		390		395
Thr Lys Arg Leu Arg Glu Ile Leu Val Ile Glu Arg Asp Arg Ala Val				400
	405		410	
Glu Asn Lys Glu Glu Phe Ile Gln Lys Phe Ser Glu Lys Leu Tyr Ser				415
	420		425	
Lys Leu Ile Glu Gly Trp Ala Asp Lys Leu Gln Phe Ile Asp Glu Asp				430
	435		440	
Asn Gln Asn Trp Leu Leu Leu Arg Ala Glu Lys Pro Val His Pro His				445
	450		455	
Ala Tyr Leu Thr Glu Ala Gly Ala			460	
465		470		

<210> 13

<211> 1380

<212> DNA

<213> *Ascaris suum*

<400> 13

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gcagatatta	tatcttcatt	acccgatcta	catggcaagg	atattgtcga	tattggcgct	180
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tttatcgaaa	gtttcatggc	aaaaaataaa	gaacggaatg	cgcatttctc	taatatctct	300
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caaatttcta	tcgaggatat	cactgagatg	tgacacagaag	cgattcataa	atatctaagc	1320
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<210> 14

<211> 1380

<212> DNA

<213> *Haemonchus contortus*

<400> 14

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ggaatcgggc	gcttcactac	tgtgctagca	gaaactgctc	gatgggttct	ttcaacggat	240
ttcatcgaat	cgttcacatga	aaaaaatcaa	gaacgaaatg	ctcacatggg	taacatcagt	300
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cgtttctcat	cgtgtatat	caagcttctt	cgagcaatcc	gatacgggga	cagtgatgga	600
aaaatgtgga	aatttgatgt	gcagtggagc	tgctcgggtg	ccacctacat	acggaggtgc	660
aataactggc	gtcaagtgca	ttggttgacg	aagaaggtag	cggcagttgg	cgacgaagag	720
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tgggatgaaa	aactagacaa	tgaaaaatac	agttggactg	ataagatatt	ctcgaatgcg	840
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cagagggacg	cttcatttga	ctgcatggta	gcaactgaac	ttctcgcgac	ttgtgatgat	1140
gagagcgtaa	agagtattgc	gagcattatg	aaaccagaag	cgaagggtgg	gctcctcgaa	1200
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aacattacca	tcgtcgatgt	tacacaggag	tccttgaacg	ccgaggtttc	tttcattaa	1320
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<210> 15
 <211> 1371
 <212> DNA
 <213> Meloidogyne incognita

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 gataaatttg aagctcttga cagagccgaa attatcggaa tgttgccctc ttttaaaaat 180
 aaatttgttg tggatattgg ggcgggtatt ggaagattca caacagaatt tgccaaaaag 240
 gcaagagaag tggctctcaac agattttgta gctagcttta tgcagaaaaa tcgggaaaca 300
 aatatagcct ttaataacat tgaatggaga gttgggtgatg ctgtaagatt agattttgaa 360
 gagggggagta ttgatatagt ctttaccaat tggcttttga tgtatttagt ggatgaagaa 420
 gttgttcaat ttttgattaa tgccattaaa tggctcaggc ctggcgggta ttacatttg 480
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 gatagtatca atccaactaa atatcgcttt tcatccgcat atattcaatt gctcaaatca 600
 attaatttta aaagcggaga tggaaaccgtt tgggggttta aaatccactg ggctagctct 660
 gttaattgtt atattcaaaa aaatgcaaat tggagacaag tgcattgggt agtaagcaag 720
 gttcctaaaa aggaaaaatt tatgccaaat ttgggtacac tgcttggaga gaagtggcct 780
 gaagagcaga aggaatggga caataaactt gacttggctt tgaatgagaa tcagaatatc 840
 acctcaactc tagccagtta tcttttatct agtgggattg gaacaaattc agttatactt 900
 gttttcgact tgagaaatag tgaaaatcag cccagtatta atgttcacac attggctaac 960
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 acccttgcta ataataacca agatcgacgg attagacact cttggcatga ggatattgaa 1080
 agcgctttcc actttttggg tgaacaaata tccggcaaaag agaaaaatat cagcagatta 1140
 tttgatgtga ttattggtat tggtttgta gaaaaaatta aaaaaatgaa ggacgctagc 1200
 gagaaagttg agaaaatcct tggccgttat ttgttaagta ttgaaacagg cgaaggagat 1260
 gatatacgaa aggaaaaaaa gaatgaggac attgtagaat atttcccatc agaactattt 1320
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<210> 16
 <211> 1407
 <212> DNA
 <213> Strongyloides stercoralis

<400> 16
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 catgatgtat gtctattact tcttgattta aaaggaaaaa ctgtttttaga tgctggtgct 180
 ggaattggac gttttactgc tgaacttgct gaaagggtcg aaaaagttha tgcatacagat 240
 tttatttctg aatatgttac taaattacaa gaacttagtg ctgaagcggt aaaaaatgga 300
 aaaattattg atgttacagt agcagatgct acatgtcttt cttatccaga gaatagttat 360
 ttccttgttt ttactaattg gttgtttatg tattttaata atactgaatg tgtacgtttt 420
 actgtaaatg cattaaaatg gttagaagaa ggtggatatt ttaaattaag agaatacatg 480
 tctgaacct caacaagaag agttggaaat agaaatgaaa cttctcttca tgctgccgtt 540
 caatcaaatc caactgaata tagattttca tctgtttatc ttaaattaat tgaagcagct 600
 agatacgttg attcaaataa tcaaaaatgg aaattcgaaa tagaaatttg tggttctatt 660
 ccaacataca ttttaaatgg taatacttgg agacaagtac agttaattgc taaaaaagta 720
 aaagcagatg ataatgatgt tgttttatcc caagatgagt tgaaaaattt aatgactaat 780
 gattggataa tggaaacaaa aaagactgat tctattgttg atggtagagt acaatatttt 840
 gctgataaaa tttttgctaa tgaattatca aatattgata tgactaatac tgaatccatt 900
 tcatcaatat ttgttttcca atcttcattt aatccatggg acaaaagaat tttcccat 960
 tcttttagcat caaataaata ttgccatgtc tggacaaatg agggtaatcg tgaacttttt 1020
 agatgttcat taacttcagc taatgaagaa agaaatattg gaatgttttt tacctattca 1080
 aaagacaatg tttttaatgc cttagattac gttaaaaaaa gaaacttttt attaaacagt 1140
 tttctagcta ttgactattt aaataatcat gaagttaatt ttattgaatc atttaataat 1200
 attgcttctc aagatgctaa aattctcctt cttgaatcat tttcaaatga ggatgaaaaa 1260

aattttaa	taagtaa	taataag	tacacag	agtgcg	agaaaac	1320
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aaatgg	ttatcaa	aaac				1407

<210> 17
 <211> 1311
 <212> DNA
 <213> *Ascaris suum*

<400> 17						
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gcactcttt	aggacagag	aattaacgt	accatcggt	agcgtcttg	gggattgcaa	180
agcactcg	ctgacgcata	tgacgccatt	atcagcaata	aattgatcgt	cgagaactgt	240
ttaatcaata	aaccatcaga	tctcgataca	ttcgtcgcat	cggctctaaa	agaagaagg	300
gtactcatc	ttcgtgaaga	cctaaatgg	tgttctgcgt	gtgagaagg	cgctcagcta	360
acgcatttct	ttgatctgtt	togaacaact	ctgaacggcg	ttacgattgg	cttcaaattc	420
tattcactca	agcaagtcaa	tgccctcaatt	cataccgaag	gaaactttct	ggatgtcttc	480
tggatattgc	ggaaagaatg	tttcgaagcg	ctggacgaga	acaaaaaac	aaaaaccttt	540
cgtgatcttc	tcgatactac	gcaatacact	gacgagagca	tacgtgcata	tgaatggatc	600
ttcggcgata	acttcatcag	tccggg	tatgacgaaa	acttagaagt	tctgaagcga	660
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gcccgccagg	ctgctaggga	attcggagcg	ctggttctcg	gtatggatat	tagtgcgat	780
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atatccgacg	ctctcgaata	tgagtttcca	gccaactcgt	ttgattacgt	tttcagtcgt	900
gacggtttac	atcataacga	gcgcacgcac	atcgtaatgc	gaaagatttt	ccactgggtg	960
aaacctgggtg	ggaaagtgtc	catcacgggtg	tatggcatgg	gccatgggac	attaagcgcg	1020
aaattccaag	cctatgtgga	aaagaggaaa	tattttctga	agacactcga	agagatgggt	1080
gagataactg	aagctgctgg	attcgaaaat	gtgcaaggga	caaacctcac	caagcgattc	1140
cgcgatatac	tgctcgacga	gcggacaaaa	acgctgaacc	gaaaaaacga	attccttgag	1200
aaattcgatg	aaggaacatt	caacagcctc	ttgaacggat	ggaatgataa	gatcggtttt	1260
atcgacgacg	ataaccataa	ttggaatcag	atcttcgcaa	caaaaccact	t	1311

<210> 18
 <211> 1416
 <212> DNA
 <213> *Meloidogyne javanica*

<400> 18						
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tctgatctaa	gaaatttatt	cgaagataaa	tttaatttgg	aggagatgga	tattggagag	180
ttgataaata	tatcagaacg	tttagataaa	gaagataatg	acaacgaaga	agagaattta	240
gaaacacggt	ttgatgctgc	tatttgctct	aatttattta	ttggacaagg	aattgtaaat	300
gaccgtcatc	gtattgctca	agtattagga	ttacttcttc	gtttaatacg	gacagatgga	360
gttgtaatta	ttagagaaaa	tctaaagcaa	tggggttctc	gttcaattgc	tgatttaact	420
aaatttcttg	atgtttttgc	ttttcgaaaa	caacaaaata	atcaaaaaca	acaacaaa	480
cttggattta	atttttatgg	aatgagccaa	gtacaggaca	gcatttatgc	acatttctaat	540
tttcttgacg	ttttttggag	cttaacaaca	gctattgaag	ttagattata	tgatgataaa	600
ttagctactt	ttagggaatt	tttgataaa	acacagtata	ctgaggacaa	cgttgctagt	660
tatgagtgga	tatttgggac	agattttatc	agccaggtg	gagtgaatga	aaatagaaga	720
gtactaaaat	atttccgtca	tttacgtcca	ggacaacaaa	tgcttgatat	tggtgttgga	780
attggtggag	gagctagaca	agctgctagg	gagtttggtc	ttcaagtact	tggttgtgat	840
ctttcttcaa	atatgattca	acatgctttt	gatcgtaatc	aacgtgacaa	agatcatcgt	900
gttgaatatc	aaattgctga	tgctatgggt	tatcgttatg	aatctaattgc	ttttgatatt	960
gtatttagta	gagattgtat	tcaacatatt	aaagatacaa	aaagattatt	tagaaatatt	1020
tatacttggc	ttaaaccagg	tggacaagta	cttggtacaa	tgtatgggaa	aggacatgga	1080

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gaagaatata gagaaattgc tcataatgtt ggtttaacaa ctatttacac agaaaatatg 1200
actaaacggt tgagagaaaat tttagtaatt gaacgtgata gagcagttga aaataaagaa 1260
gaatttattc aaaaatttag tgaaaaactt tattcaaaat taattgaggg ttgggcagat 1320
aaattacaat ttattgatga agataaccaa aattggttgt tacttcgtgc ggagaaaccg 1380
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<210> 19

<211> 475

<212> PRT

<213> *Caenorhabditis elegans*

<400> 19

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Met Ser Thr Asp Gln Gln Ser Ser Val Glu Asp Gln Thr Val Ala Met
 1          5          10          15
Val Asn Val Arg Arg Ala Asn Phe Lys Ser Phe Trp Asp Lys Tyr Ser
 20          25          30
Asp Lys Pro Asp Thr Asn Ser Met Met Leu Asn His Ser Ala Glu Glu
 35          40          45
Leu Glu Ser Ser Asp Arg Ala Asp Ile Leu Ala Ser Leu Pro Leu Leu
 50          55          60
His Asn Lys Asp Val Val Asp Ile Gly Ala Gly Ile Gly Arg Phe Thr
 65          70          75          80
Thr Val Leu Ala Glu Thr Ala Arg Trp Val Leu Ser Thr Asp Phe Ile
 85          90          95
Asp Ser Phe Ile Lys Lys Asn Gln Glu Arg Asn Ala His Leu Gly Asn
100          105          110
Ile Asn Tyr Gln Val Gly Asp Ala Val Gly Leu Lys Met Glu Ser Asn
115          120          125
Ser Val Asp Leu Val Phe Thr Asn Trp Leu Met Met Tyr Leu Ser Asp
130          135          140
Glu Glu Thr Val Glu Phe Ile Phe Asn Cys Met Arg Trp Leu Arg Ser
145          150          155          160
His Gly Ile Val His Leu Arg Glu Ser Cys Ser Glu Pro Ser Thr Gly
165          170          175
Arg Ser Lys Ala Lys Ser Met His Asp Thr Ala Asn Ala Asn Pro Thr
180          185          190
His Tyr Arg Phe Ser Ser Leu Tyr Ile Asn Leu Leu Arg Ala Ile Arg
195          200          205
Tyr Arg Asp Val Asp Asn Lys Leu Trp Arg Phe Asn Val Gln Trp Ser
210          215          220
Cys Ser Val Pro Thr Tyr Ile Lys Arg Ser Asn Asn Trp Arg Gln Val
225          230          235          240
His Trp Leu Ala Glu Lys Val Pro Ala Glu Asp Gly Ala Lys Gly Thr
245          250          255
Ser Phe Asn Glu Leu Val Glu Leu Ile Lys Asn Thr Trp Gln Asn Glu
260          265          270
Gln Glu Ala Trp Asp Ala Lys Leu Asp Asp Glu Lys Tyr Val Trp Thr
275          280          285
Asp Lys Val Phe Ser Ser Ala Leu Thr Ser Leu Pro Ser Asn Ser Thr
290          295          300
Phe Phe Leu Tyr Thr Pro Arg Thr Val Ser Pro Tyr Cys His Ile Asn
305          310          315          320
Ala His Thr Leu Ala Glu Thr Phe Asn Ala Asn Val Trp Asn Thr Glu
325          330          335
Ile Ile Pro Glu Tyr Tyr Arg Thr Ser Leu Thr Lys Ser Asn Asn Leu
340          345          350

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Lys Asp Gln Arg Val Arg Phe Gly Trp Asn Gln Ser Leu Thr Asp Ser
    355                      360                      365
Val Thr Tyr Trp Gln Gln Lys Asp Ala Leu Phe Asp Val Phe Val Ala
    370                      375                      380
Thr Glu Phe Leu Ser Thr Val Asp Asp Glu Thr Ile Arg Gln Leu Pro
385                      390                      395                      400
Asn Val Met Ser Asp Gly Ala Lys Phe Ile Thr Leu Glu Pro Val Asp
    405                      410                      415
Glu Val Asn Glu Ala Glu Met Lys Gln Arg Ile Gln Glu Leu Gly Tyr
    420                      425                      430
Thr Leu Lys Ser Phe Thr Asp Val Thr Asp Gln Cys Ile Glu Ala Gln
    435                      440                      445
Glu Gln Tyr Phe Lys Asp His Glu Gln Leu Arg Asp Glu Lys Val Ile
    450                      455                      460
Arg Lys Asn Trp Val Leu Leu Glu Leu Thr His
465                      470                      475

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<210> 20

<211> 484

<212> PRT

<213> Caenorhabditis elegans

<400> 20

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Met Asp Arg Tyr Ser Pro Tyr Asp Lys Thr Val Phe Leu Ile Phe Cys
 1          5          10          15
Thr Ala Tyr Ile Leu Gln Lys Ala Met Val Asn Val Arg Arg Ala Asn
    20          25          30
Phe Lys Ser Phe Trp Asp Lys Tyr Ser Asp Lys Pro Asp Thr Asn Ser
    35          40          45
Met Met Leu Asn His Ser Ala Glu Glu Leu Glu Ser Ser Asp Arg Ala
    50          55          60
Asp Ile Leu Ala Ser Leu Pro Leu Leu His Asn Lys Asp Val Val Asp
65          70          75          80
Ile Gly Ala Gly Ile Gly Arg Phe Thr Thr Val Leu Ala Glu Thr Ala
    85          90          95
Arg Trp Val Leu Ser Thr Asp Phe Ile Asp Ser Phe Ile Lys Lys Asn
    100         105         110
Gln Glu Arg Asn Ala His Leu Gly Asn Ile Asn Tyr Gln Val Gly Asp
    115         120         125
Ala Val Gly Leu Lys Met Glu Ser Asn Ser Val Asp Leu Val Phe Thr
    130         135         140
Asn Trp Leu Met Met Tyr Leu Ser Asp Glu Glu Thr Val Glu Phe Ile
145         150         155         160
Phe Asn Cys Met Arg Trp Leu Arg Ser His Gly Ile Val His Leu Arg
    165         170         175
Glu Ser Cys Ser Glu Pro Ser Thr Gly Arg Ser Lys Ala Lys Ser Met
    180         185         190
His Asp Thr Ala Asn Ala Asn Pro Thr His Tyr Arg Phe Ser Ser Leu
    195         200         205
Tyr Ile Asn Leu Leu Arg Ala Ile Arg Tyr Arg Asp Val Asp Asn Lys
    210         215         220
Leu Trp Arg Phe Asn Val Gln Trp Ser Cys Ser Val Pro Thr Tyr Ile
225         230         235         240
Lys Arg Ser Asn Asn Trp Arg Gln Val His Trp Leu Ala Glu Lys Val
    245         250         255
Pro Ala Glu Asp Gly Ala Lys Gly Thr Ser Phe Asn Glu Leu Val Glu
    260         265         270

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Leu Ile Lys Asn Thr Trp Gln Asn Glu Gln Glu Ala Trp Asp Ala Lys
    275                      280                      285
Leu Asp Asp Glu Lys Tyr Val Trp Thr Asp Lys Val Phe Ser Ser Ala
    290                      295                      300
Leu Thr Ser Leu Pro Ser Asn Ser Thr Phe Phe Leu Tyr Thr Pro Arg
    305                      310                      315                      320
Thr Val Ser Pro Tyr Cys His Ile Asn Ala His Thr Leu Ala Glu Thr
    325                      330                      335
Phe Asn Ala Asn Val Trp Asn Thr Glu Ile Ile Pro Glu Tyr Tyr Arg
    340                      345                      350
Thr Ser Leu Thr Lys Ser Asn Asn Leu Lys Asp Gln Arg Val Arg Phe
    355                      360                      365
Gly Trp Asn Gln Ser Leu Thr Asp Ser Val Thr Tyr Trp Gln Gln Lys
    370                      375                      380
Asp Ala Leu Phe Asp Val Phe Val Ala Thr Glu Phe Leu Ser Thr Val
    385                      390                      395                      400
Asp Asp Glu Thr Ile Arg Gln Leu Pro Asn Val Met Ser Asp Gly Ala
    405                      410                      415
Lys Phe Ile Thr Leu Glu Pro Val Asp Glu Val Asn Glu Ala Glu Met
    420                      425                      430
Lys Gln Arg Ile Gln Glu Leu Gly Tyr Thr Leu Lys Ser Phe Thr Asp
    435                      440                      445
Val Thr Asp Gln Cys Ile Glu Ala Gln Glu Gln Tyr Phe Lys Asp His
    450                      455                      460
Glu Gln Leu Arg Asp Glu Lys Val Ile Arg Lys Asn Trp Val Leu Leu
    465                      470                      475                      480
Glu Leu Thr His

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<210> 21

<211> 437

<212> PRT

<213> Caenorhabditis elegans

<400> 21

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Met Ser Ser Leu Ser Ile Pro Arg Gln Ser Leu Tyr Tyr Val Asn Lys
  1          5          10          15
Val Thr Glu Gly Arg Ser Val Ser Asn Val Gln Val Val Ser Pro Cys
    20          25          30
Gln Lys Gln Gly Gln Thr Tyr Val Thr Ala Phe Thr Pro Leu Thr Ser
    35          40          45
Asn Val Gln Val His Thr Ser Leu Glu Gln Leu Ser Thr Ile Arg Asn
    50          55          60
Ala Asp Val Leu Ile Phe Asn Asn Ala Leu Ser Gln Ile Ile Thr Asn
    65          70          75          80
Ala Asp Leu Leu Thr Asp Phe Leu Lys Asn Ala Thr Asn Ala Thr Ala
    85          90          95
Ile Gly Gly Thr Val Ile Ile Arg Glu Asp Leu Lys Asp Cys Ser Asp
    100         105         110
Lys Arg Gln Val Ala Arg Leu Thr Asp Tyr Phe Asp Val Phe Arg Thr
    115         120         125
Thr Asp Ser Asp Gly Asn Asn Thr Gly Leu Asp Leu Tyr Thr Val Asp
    130         135         140
Gln Val Glu His Ser Asn Tyr Val Glu Gln Asn Phe Leu Asp Phe Ile
    145         150         155         160
Phe Val Phe Arg Lys Lys Val Phe Ala Pro Thr Thr Asp Ala Thr Ile
    165         170         175

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Thr Phe Arg Asp Phe Leu Asp Lys Thr Gln Tyr Thr Asn Thr Gly Ile
 180 185 190
 Asp Ala Tyr Glu Trp Met Phe Gly Val Asn Phe Ile Ser Pro Gly Gly
 195 200 205
 Tyr Asp Glu Asn Leu Lys Ile Ile Lys Arg Phe Gly Asp Phe Lys Pro
 210 215 220
 Gly Gln Thr Met Leu Asp Ile Gly Val Gly Ile Gly Gly Ala Arg
 225 230 235 240
 Gln Val Ala Asp Glu Phe Gly Val His Val His Gly Ile Asp Leu Ser
 245 250 255
 Ser Asn Met Leu Ala Ile Ala Leu Glu Arg Leu His Glu Glu Lys Asp
 260 265 270
 Ser Arg Val Lys Tyr Ser Ile Thr Asp Ala Leu Val Tyr Gln Phe Glu
 275 280 285
 Asp Asn Ser Phe Asp Tyr Val Phe Ser Arg Asp Cys Ile Gln His Ile
 290 295 300
 Pro Asp Thr Glu Lys Leu Phe Ser Arg Ile Tyr Lys Ala Leu Lys Pro
 305 310 315 320
 Gly Gly Lys Val Leu Ile Thr Met Tyr Gly Lys Gly Tyr Gly Glu Gln
 325 330 335
 Ser Asp Lys Phe Lys Thr Tyr Val Ala Gln Arg Ala Tyr Phe Leu Lys
 340 345 350
 Asn Leu Lys Glu Ile Ala Asp Ile Ala Asn Lys Thr Gly Phe Val Asn
 355 360 365
 Val Gln Thr Glu Asn Met Thr Pro Arg Phe Lys Glu Ile Leu Leu Glu
 370 375 380
 Glu Arg Gly His Leu Glu Gln Asn Glu Ala Glu Phe Met Ser Lys Phe
 385 390 395 400
 Thr Gln Arg Glu Arg Asp Ser Leu Ile Ser Gly Trp Thr Asp Lys Leu
 405 410 415
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 420 425 430
 Lys Pro Phe Pro Lys
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<210> 22
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 <213> Artificial Sequence

<220>
 <223> primer

<400> 22
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22

<210> 23
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 23
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20

<210> 24
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 24
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19

<210> 25
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 25
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17

<210> 26
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 26
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20

<210> 27
 <211> 22
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<220>
 <223> primer

<400> 27
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22

<210> 28
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 28
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37

<210> 29
 <211> 20

<212> DNA
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<220>
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<400> 29
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<210> 30
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 30
 catacgtatt tctcatcatc 20

<210> 31
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 31
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<210> 32
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<220>
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<400> 32
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<210> 33
 <211> 21
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 <213> Artificial Sequence

<220>
 <223> primer

<400> 33
 gcaattgaat atatgcggat g 21

<210> 34
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

 <400> 34
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 <210> 35
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> primer

 <400> 35
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 <210> 36
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 <220>
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 <400> 36
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 <211> 26
 <212> DNA
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 <220>
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 <400> 37
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 <210> 38
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 <212> DNA
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 <220>
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 <400> 38
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 <210> 39
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 <220>

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<400> 39

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<210> 40

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<212> DNA

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<220>

<223> primer

<400> 41

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22

<210> 42

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 42

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20

<210> 43

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 43

ccgcaatatc cagaagac

18

<210> 44

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 44
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<210> 45
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 45
gttctgaacc atcaacaag 19

<210> 46
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 46
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